

Lesson: WSI: Wetland Scene Investigation (Inclement Weather Activity)

Environmental Literacy Question: How has human land use affected the living things in the Chesapeake Bay?

Topic/Essential Question: How can we identify what animals live in an area?



Unit/Lesson Sequence: This activity serves as an inclement weather alternative for the “Microorganism Discovery” lesson. The focus of the lesson is on investigating organisms in a habitat affected by humans. One of two lessons in the “Water’s Living Things” 4th grade module based at Arlington Echo Outdoor Education Center.

Content Standards:

Environmental Literacy

- 1.B.1.f. Recognize and explain that activities and technology of the human species have a major impact on other species in many ways.
- 4.A.1.b. Explain and demonstrate food webs for a particular environment.
- 5.A.2. Analyze the effects of human activities that deliberately or inadvertently alter the equilibrium of natural processes.
- 5.B.1. Analyze, from local to global levels, the effects on human activities on earth’s natural processes.
- 8.F.1.b. Identify actions that can be taken as individuals and those that require the involvement of other people, organizations and government.

Science

- 4.B.1. Recognize and describe that people in Maryland depend on, change, and are affected by the environment.
- 4.F.1.a. Identify and describe the interactions of organisms present in a habitat.

Length of Lesson: 45 minutes (times subject to change based on arrival to AE)

Student Outcome: The student will investigate a simulated wetland habitat and piece together clues to figure out what animals have been in the area and how they’ve interacted. In doing so, the student will learn the value of wetlands as an essential habitat for a diverse array of plant and animal species.

Knowledge of the Learner:

- Prerequisite knowledge, skills and processes: Students will complete two lessons in school and conduct research on human impact.
- Student needs, interests, previous learning: Students have a basic knowledge of the difference between natural and human-made systems. Animals have four basic needs which are found in their habitat: food, shelter, water and enough space to meet those requirements and to reproduce.
- Conceptual difficulties: Being able to identify the animals.
- Differentiation: Students are 4th graders, with a diversity of backgrounds and skill levels.

Knowledge of Content:

Vocabulary:

wetland	marsh	phragmites	scat
native	non-native	invasive	habitat

Resource materials:

clipboards (10)	WSI Incident Report Sheet (10)	boardwalk
dry erase markers (10)	track identification poster	painted sheet
<i>Phragmites</i> cans (3)	native grass cans (3)	Atlantic white cedar
trash pieces	acorns	dead log
beaver chewed log	leaves	

Scat activity:

Tootsie Rolls	scat scarf/poster	scat samples
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Supplements:

- A: Information on Wetlands
- B: Wetland Scene Investigation Sheet
- C: WSI set up map
- D: Vocabulary

Lesson setup:

Lay the sheet out on the resource lab floor. Allow ample room for students to walk around the sheet without having to physically step on it. Position the props as diagramed (**Supplement C**). Display the track identification poster on an easel in a prominent place. Ensure you have an ample number of laminated WSI Incident Report Sheets clipped onto clipboards and a dry erase marker ready for each group. Have tootsie rolls and scat samples nearby, but not visible just yet, so they are not a distraction.

Instructional Delivery

Engage:

- Welcome students to the activity and introduce yourself.
- Ask the students if they've ever seen the show Scooby Doo. What do the characters on the show have to do? What tools do they use to investigate?
- Inform students they'll be WSI agents—Wetland Scene Investigators. It's their job to investigate a wetland scene and figure out what's taken place. Tell students that they will have to use their senses, deductive reasoning, and teamwork to investigate a simulated wetland scene.

Explore:

1. Ask what they already know about wetlands before showing them the scene:
 - **What is a wetland? What makes up a wetland?** (*An area saturated by water for most or part of the year. Soil, water, and plants make up a wetland.*).
 - **What kind of animals would you expect to find in a wetland?** (*Many birds, reptiles, amphibians, insects, fish, and mammals live in wetlands or depend on wetlands to find food and shelter, and to raise their young.*).
 - **What signs of these animals might you expect to find?** (*Animals may leave obvious signs like footprints, scat, or remains such as bones or feathers. You may also see plants that have been eaten or trampled, nests, burrows, insect casings, sheds from crustaceans or reptiles, or any number of other subtler signs of animal presence.*).

Explain:

1. Have students get together in pairs. Hand each group a clipboard with a WSI Incident Report Sheet and a dry-erase marker.
2. Explain to students that they should consult the Track Identification Poster to identify the animal tracks. They will be using their Incident Report Sheet to figure out what animal(s) was/were involved, what evidence they notice, and what they conclude has happened.
2. For the first five minutes of investigation, the students will silently and independently observe the wetland and record their observations. Emphasize the importance of **not touching** the scene or any of its elements. It's also important for the students to not talk during this time so they can make independent observations.
3. For the next ten minutes, allow students to work cooperatively in pairs. They still may **not touch** anything on the sheet or walk on the sheet, but they may communicate with one another to share ideas while they move around the scene. Assist students with interpreting different elements of the scene.

Elaborate:

1. Bring the group together for a discussion. Allow each student to share one conclusion they've drawn from the scene. Once everyone has shared, help fill in the gaps using the instructor copy of the WSI Incident Report Sheet (which is already filled in). Collect clipboards and markers.
2. Ask what else animals can leave behind that show humans they have been in an area. (*Poop!*)
3. Tell students that there is a scientific name for animal poop – "*Scat!*" Ask them if they think that all scat looks the same.
4. Explain that animal droppings differ based on the size on the animal and also on what they eat.
 - A bear that eats a variety of things, such as berries, fish, or dead animals, will have large, tubular scat. A rabbit which eats grass hays and vegetables will have small, pellet-like scat.
5. At this point, show the students the scat scarf and/or poster and the scat samples. Inform them that they get to make their very own scat... using Tootsie Rolls!
6. For the next few minutes, let students form their Tootsie Roll into a scat of their choosing. Extend on this by allowing students to take guesses of what scat other students' made.

Evaluate:

Lead a discussion on the wetland. Ask questions such as:

- **Can you think of one reason why wetlands are so important? Think about this scene.** (*Wetlands are an important habitat for a wide variety of animals and plants. Even animals that don't live in the wetland may use it as a breeding or foraging ground*).
- **What observations can you make about the vegetation in the wetland?** (*One side of the wetland has a diverse selection of native plants. The other side is a monoculture of the invasive species phragmites*).
- **What human impacts did you observe? Were they positive or negative?** (*The introduction of non-native species such as phragmites and the feral cat cause harm to the natural environment. The boardwalk may obstruct natural habitat, but provides access for educational opportunities. Soda bottles and other floatable debris pollute the habitat and detract from its appearance. Some litter, such as plastic bags or soda rings, may even harm wildlife*).

Notes for overnights:

Remember to set up your materials prior to the morning activities (you will be dismissed early from breakfast). If you do not spend the night, please check in with the Arlington Echo staff assigned to the model and be at your teaching location at least 15 minutes before the activity begins to set up.

Notes for clean up:

Please clean, organize and return the lesson materials to their proper locations at the end of each day of instruction. Remember to inform the Arlington Echo staff if you need assistance or if any materials are damaged or missing.